

## CLAIMS

1. A latching blocking mechanism, comprising:
  - a static component including an elongate guide;
  - a static abutment surface;
  - a movable component slidable along the guide between initial and shifted positions;
    - a control member arranged for movement with the movable component in the sliding direction thereof but displaceable with respect thereto in a direction transverse to the sliding direction of the movable component, the control member initially being disposed at a first position relative to the movable component;
    - control means arranged to urge the control member transversely towards a second position from the first position, which control means becomes active only after the control member has moved by a predetermined distance from its first position towards its second position; and
    - a static camming part co-operable with a moving camming part on the control member and arranged to move the control member through said predetermined distance from its first position on movement of the movable component from its initial position towards its shifted position;
    - whereby following the movement of the control member through said predetermined distance and the return of the movable component towards its initial position, the control member is driven by the control means to a blocking position between the static abutment surface and the movable component thereafter to block further movement of the movable component towards its shifted position.
  - 2. A latching blocking mechanism as claimed in claim 1, wherein there is provided initialisation means to maintain the control member in its first position.
  - 3. A latching blocking mechanism as claimed in claim 2, wherein the initialisation means includes initialisation spring means arranged to urge the

control member from its first position in said transverse direction, away from its second position.

4. A latching blocking mechanism as claimed in claim 3, wherein the initialisation spring means urges the control member to bear on the guide, for 5 sliding movement therealong.

5. A latching blocking mechanism as claimed in claim 2, wherein the initialisation means includes initialisation spring means arranged to urge the control member into engagement with the movable component, in opposition to the sliding direction of the movable component towards its shifted position.

10 6. A latching blocking mechanism as claimed in claim 5, wherein the movable component has a transversely extending control surface on to which the control member is urged by said initialisation spring means.

7. A latching blocking mechanism as claimed in claim 6, wherein said control surface of the movable component is a ramp surface inclined towards 15 the guide.

8. A latching blocking mechanism as claimed in claim 6, wherein said control surface of the movable component has a detent with which the control member is engaged under the action of the initialisation spring means.

9. A latching blocking mechanism as claimed in any of claims 3 to 8, 20 wherein the initialisation spring means comprises a helical compression spring acting between the control member and a static part adjacent the shifted position of the movable component.

10. A latching blocking mechanism as claimed in any of the preceding claims, wherein the control means includes control spring means arranged to 25 urge the control member towards its second position.

11. A latching blocking mechanism as claimed in claim 10, wherein the movable component has a further surface on to which the control member is urged by the control spring means, which further surface is inclined towards the second position of the control member and adjoins the control surface of the 30 initialisation means.

12. A latching blocking mechanism as claimed in claim 11, wherein the junction between the control surface and the further surface defines the predetermined distance from the first position of the control member and through which the control member is moved by the co-operable camming parts.
- 5 13. A latching blocking mechanism as claimed in any of claims 5 to 8 and in which the control means includes control spring means arranged to urge the control member towards its second position, wherein a single spring serves as both the initialisation spring means and the control spring means.
- 10 14. A latching blocking mechanism as claimed in claim 13, wherein said single spring comprises a helical compression spring acting between the control member and a static part adjacent the forward position of the movable component.
- 15 15. A latching blocking mechanism as claimed in claim 10, wherein the movable component has first and second parts between which the control member is located, the first and second parts being relatively movable in the direction of sliding movement of the movable component.
- 20 16. A latching blocking mechanism as claimed in claim 15, wherein the control spring means urges the first part of the movable component towards the second part, the first part having a cam surface engageable with the control member to drive the control member in said transverse direction under the action of the spring means, once the control member has been moved through said predetermined distance.
- 25 17. A latching blocking mechanism as claimed in claim 16, wherein the cam surface of the first part engages the moving camming part of the control member, following movement of the control member through said predetermined distance.
18. A latching blocking mechanism as claimed in any of the preceding claims, wherein the static camming part is formed on the guide.
- 29 19. A latching blocking mechanism as claimed in claim 18, wherein the static camming part is located on the guide at a position to govern the distance

through which the movable component has to move from its initial position towards its shifted position before the control member is moved said predetermined distance, whereafter blocking of the movable component will occur on returning the movable component towards its initial position.

- 5 20. A latching blocking mechanism as claimed in any of the preceding claims, wherein the static component is tubular and the guide is formed internally thereof to extend parallel to the axis of the component.
- 10 21. A latching blocking mechanism as claimed in claim 20, wherein the tubular static component has a plurality of similar parallel guides formed internally around the internal surface of the static component.
22. A latching blocking mechanism as claimed in claim 21, wherein each guide also provides a respective abutment surface behind which the control member engages to block further movement of the movable component.
- 15 23. A latching blocking mechanism as claimed in any of claims 20 to 22, wherein the movable component is cylindrical and is mounted for sliding movement within the tubular static component.
24. A latching blocking mechanism as claimed in claim 23, wherein the movable component is restrained against rotation with respect to the static component by a guide formed therein.
- 20 25. A latching blocking mechanism as claimed in any of claims 21 to 24, wherein the control member is cylindrical and slides with the movable component within the static component, and is turned about the axis of the tubular static component.
- 25 26. A latching blocking mechanism as claimed in claim 25, wherein the control member has portions which respectively co-act simultaneously with each guide member, and which then move towards the next adjacent guide to engage the abutment surface thereof to perform the blocking function.
27. A latching blocking mechanism as claimed in any of claims 20 to 26 and adapted for use with a medical syringe provided with an injection needle projecting from a forward part of the syringe, the syringe being connectible to

the movable component so that the needle is enclosed by the static component, the syringe and needle being slideable to a shifted position with respect to the tubular static component to cause the needle to project therefrom, and on withdrawing the needle back into the tubular static component, the movable component is blocked by the control member from moving to a shifted position again.

28. A latching blocking mechanism as claimed in claim 27, wherein the movable component is provided with a socket into which a forward part of the syringe is receivable.

10 29. A latching blocking mechanism as claimed in claim 27, wherein the movable component is provided with a socket into which the hub of a conventional needle is receivable.

30. A safety medical needle assembly, comprising:

- a tubular component including an internal elongate guide;
- 15 – an abutment surface formed on the tubular component;
- a movable component disposed within the tubular component and arranged for axial sliding movement with respect thereto between initial and shifted positions, the movable component being adapted to receive the hub of a medical needle so that the needle projects within but is protected by the movable component when in its initial position;
- a control member arranged for axial movement with the movable component but rotatable with respect to the movable component, the control member initially being disposed at a first position relative to the movable component;
- 25 – control means arranged to urge the control member towards a second position angularly displaced from the first position, which control means becomes active only after the control member has turned through a predetermined angle towards the second position; and
- a camming part on the tubular component co-operable with a moving camming part on the control member and arranged to turn the control member

through said predetermined angle from its first position on axial movement of the movable component towards its shifted position to cause the needle to project from the movable component;

- whereby the movement of the movable component towards its shifted position to cause the needle to project therefrom also causes the control member to turn through said predetermined angle whereafter the return of the movable component towards its initial position allows the control member to move behind the abutment surface under the action of the control means, thereafter to block further axial movement of the movable component towards its shifted position.

5. 31. A safety medical needle assembly as claimed in claim 30, wherein the camming part on the tubular component comprises an abutment formed on the guide, and the camming part on the control member is engageable therewith to cause turning movement of the control member during an initial stage of the movement of the movable component from its initial position.

15. 32. A safety medical needle assembly as claimed in claim 30, wherein the camming part on the tubular component comprises a projection formed on the guide and disposed at or adjacent the end thereof, for engagement by the camming part on the control member as the movable component approaches its shifted position, to cause turning movement of the control member.

20. 33. A safety needle assembly as claimed in any of claims 30 to 32, wherein there is provided a helical compression spring acting between the tubular component and the movable component, to urge the movable component towards its initial position.

25. 34. A safety medical needle assembly as claimed in claim 33, wherein the compression spring is pre-loaded to apply a torque to the movable component, to rotate the movable component towards its second angular position.

30. 35. A safety medical needle assembly as claimed in claim 34, wherein there is provided initialisation means including a control surface on the movable component and on to which the control member is urged by said spring.

36. A safety medical needle assembly as claimed in claim 35, wherein said control surface of the movable component is a ramp surface inclined towards the guide.

37. A safety medical needle assembly as claimed in claim 35, wherein said 5 control surface of the movable component extends in a radial plane.

38. A safety medical needle assembly as claimed in claim 37, wherein said control surface of the movable component has a detent with which the control member is engaged under the action of the spring.

39. A safety medical needle assembly as claimed in any of claims 33 to 39, 10 wherein the movable component has a further surface on to which the control member is urged by the spring, which further surface is inclined towards the second position of the control member and adjoins the control surface of the first control means.

40. A safety medical needle assembly as claimed in claim 39, wherein the 15 junction between the control surface and the further surface defines the predetermined angle from the first position of the control member through which the control member is turned by the co-operable camming parts.

41. A safety medical needle assembly as claimed in claim 30, wherein the movable component has first and second parts between which the control 20 member is located, the first and second parts being relatively movable in the axial direction of the tubular component.

42. A safety medical needle assembly as claimed in claim 41, wherein there is provided spring means to urge the first part of the movable component towards the second part, the first part having a cam surface engageable with 25 the control member to turn the control member under the action of the spring means, once the control member has been turned through said predetermined angle.

43. A safety medical needle assembly as claimed in claim 42, wherein the cam surface of the first part engages the moving camming part of the control

member, following movement of the control member through said predetermined angle.

44. A safety medical needle assembly as claimed in any of claims 30 to 43, wherein the tubular component has a plurality of similar parallel guides formed 5 internally of the component in an angularly-spaced disposition.

45. A safety medical needle assembly as claimed in claim 44, wherein each guide provides said abutment surface behind which the control member engages to block movement of the movable component towards its shifted position.

10 46. A safety medical needle assembly as claimed in any of claims 30 to 45, wherein the medical needle has a hub at its rear end, the hub being removably mounted in the movable component and being configured to receive the forward part of a syringe to be connected thereto.

15 47. Injection apparatus, comprising a safety medical needle assembly as claimed in any of claims 30 to 46 in combination with a syringe connected to a needle supported in the safety needle assembly.